



Europäisches Patentamt  
European Patent Office  
Office européen des brevets

⑪ Publication number:

0 262 282  
A1

⑫

## EUROPEAN PATENT APPLICATION

⑬ Application number: 86830281.1

⑮ Int. Cl. 1: F16B 2/24

⑭ Date of filing: 02.10.86

⑯ Date of publication of application:  
06.04.88 Bulletin 88/14

⑰ Designated Contracting States:  
AT BE CH DE ES FR GB GR LI NL SE

⑯ Applicant: PICO-GLASS S.p.A.  
Via S. Stefano, 11  
Bologna (IT)

⑰ Inventor: Ghislazoni, Antonio  
Via Privata S. Maria, 5  
Lecco (Como) (IT)

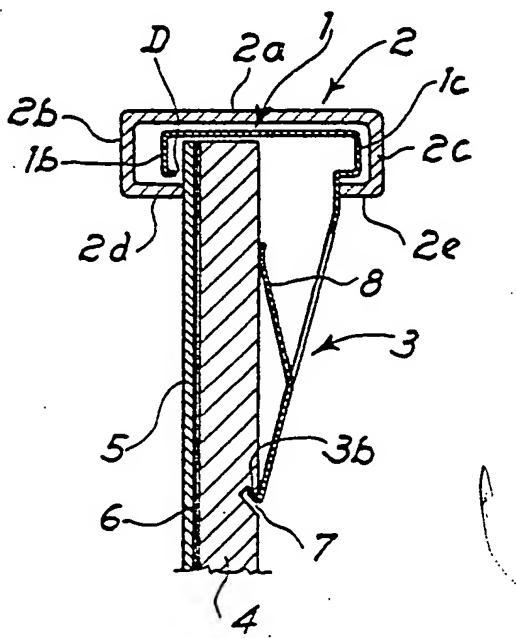
⑰ Representative: Caregaro, Silvio et al  
c/o Società Italiana Brevetti S.p.A. Via  
Carducci 8  
I-20123 Milano (IT)

⑲ Clamp suitable to secure two panels together to form a picture holder and apt to have a frame applied to it.

⑲ The present invention relates to a clamp for locking two panels together in order to form a picture holder and apt to permit fitting a frame on it.

The clamp in question has a side or head (1) suitably shaped, particularly "C" shaped allowing the application of a section (2) of substantially "C" shaped cross section which is suitable to be applied on clamp head (1) embracing this completely from the outside and locking itself on its thereby to form one side of the frame. By fitting three clamps on the remaining three sides of the picture holder and securing three corresponding sections; the complete frame for the picture holder is obtained.

Fig. 2



EP 0 262 282 A1

CLAMP SUITABLE TO SECURE TWO PANELS TOGETHER TO FORM A PICTURE HOLDER AND APT TO HAVE A FRAME APPLIED TO IT"

This invention relates to a clamp suitable to lock two panels together in order to form a picture holder or similar device, which is also suitable to permit the application of a frame to it.

Clamps of this type are known, which permit securing a first or rear panel to a second transparent or front panel, between which the picture to be displayed, generally a photograph, is interposed. Said clamps generally consist of a suitably shaped elastically deformable metal laminae which, on one hand acts on the edges of the panels to interlock them and, on the other hand, with a folded end, engages in a groove provided on the back panel to consolidate the clamping action.

Picture holders utilizing clamps of this type have been widely diffused; as it is known, they can be easily removed to disassemble the picture holder and replace the picture or photograph.

The picture holders above considered however present several drawbacks limiting their utilization by the user.

A first drawback consists in that the picture holders completely lack a lining or protective elements on their edges because the panels are secured to each other exclusively by said clamps of very limited width. This lack of protection on the sides of the picture holder exposes the subject held between the panels to the penetration of dust, moisture and vapors which may cause a rapid deterioration of the above-mentioned subject. As a result, the main function of a picture holder, which is that of maintaining the subject unaltered, is lacking.

A further drawback of picture holders now on the market consists in the fact that the clamps are in view and consequently this is a negative point for the appearance of the picture holder.

In order to provide the picture holders with a frame, the frame itself was fabricated beforehand and the two panels (front and rear) applied to it with the subject to be displayed interposed between them. This solution however turned out to be very costly because of pre-assembly of the frame which generally takes place (for wooden frames) by securing the frame sides to each other at a point near to the corners, for example by cementing or by applying nails, staples, angles or similar devices. For metal or plastic frames, the above operation is even more complex.

The preliminary production of the frames therefore involves considerable production costs for the companies producing such picture holders.

It is the object of this invention a clamp for securing reciprocally two panels to obtain a picture holders or similar device, which enables to obviate all of the above-mentioned drawbacks.

- 5 According to one of the main features of the clamp object of this invention, it permits the direct execution of a frame on the picture holder, one side at a time, without requiring preliminary and complete formation of the frame itself.
- 10 All the time consuming and complex above mentioned preliminary operations for the assembly of the frame are eliminated, thereby affording an evident and substantial saving in production costs.
- 15 A further advantage of the clamp according to this invention, deriving from the extreme simplicity with which the frame can be assembled and disassembled, lies in the fact that the picture holder can be sold with the frame completely disassembled which can be directly applied by the consumer.
- 20 If necessary, the disassembled frames can be sold separate from the panels of the picture holder, thereby affording a wider selection to the consumer.
- 25 A still further advantage of the clamp according to this invention lies in the fact that it permits, for production of the frames, the use of at present not very well used materials instead of wood, for example, plastic material, aluminium, brass or similar materials the assembly of which is difficult with the systems hereinabove described.
- 30 The characteristics and advantages of the clamp according to this invention will be evident from the following detailed description, given by way of example with reference to the annexed drawings of which:
- 35 FIGURE 1 is a side view of the clamp according to the present invention in its position of rest, before being applied to the picture holder;
- 40 FIGURE 2 is a transversal view in cross section of the clamp applied to the picture holder, on which, in turn, a frame segment is applied;
- 45 FIGURE 3 is a perspective view of the clamp applied to the picture holder, with the frame segment disengaged from the clamp itself;
- 50 FIGURE 4 is a perspective view of the clamp applied to the picture holder on which the frame section is arranged according to section IV-IV of Fig. 3;
- 55 FIGURE 5 is a view similar to that of Fig. 4, showing how the frame segment is applied to the clamp;

FIGURE 6 is a transversal cross sectional view of a clamp similar to that of Fig. 1, applied on the picture holder;

FIGURE 7 is a view in transversal cross section of a clamp similar to that of Fig. 1, applied to the picture holder;

FIGURE 8 is a view in cross section of a clamp similar to that of Fig. 1, as applied to the picture holder;

FIGURE 9 is a perspective view showing an example of embodiment of a frame realizable by means of the clamp according to this invention;

FIGURE 10 is a perspective view showing a further example of a frame which may be obtained by means of the clamp according to this invention.

Before proceeding to the detailed description of the clamp according to this invention, it should be noted that, in the annexed drawings, it is shown applied to a portion of one of the sides of the picture holder. Said portion can be either a mid portion of the picture holder side or an end portion of same, depending on the picture holder dimensions. In fact the clamp in question can be applied either alone or in combination with another clamp on each side of the picture holder, the number and position of the clamps have nothing to do with the concept of novelty of this invention.

At first reference will be made to Figs. 1 to 5.

From the above figures, in particular, Fig. 1, it can be noted that the clamp according to the invention, viewed in cross section, is substantially "L" shaped and one of its sides, indicated as a whole by 1, can be considered as the "head" of the clamp which is the part designated to be applied to the edges of the panels and which is suitable to receive and retain, in its top part, a section identified as a whole by 2 which forms one side of the frame. The other side of the clamp, identified as a whole by 3, is the portion designated to be arranged behind the rear panel of the picture holder and to engage with the latter to interlock the clamp and so the two panels to each other.

The picture holder generally consists of a rear panel 4, made of non transparent material, such as, for example, cardboard, plastic material, wood or similar material and a transparent front panel 5, made of example of plastic, glass or similar materials. Between rear panel 4 and front panel 5 is interposed a subject 6 to be displayed by the picture holder and which generally consists of a photograph.

Part 1 or "head" of the clamp, designated to be applied to one of the edges of the picture holder and receive on its top part a section 2 constituting one segment or side of the frame, is substantially "C" shaped, as shown in particular in Figs. 1 and 2, its main side 1a being designated to

be disposed perpendicular to elements 4, 5 and 6 constituting the picture holder, while its two opposite sides 1b and 1c have end edges 1d and 1c folded at an angle of 90° with respect to said sides. Both sides 1b and 1c, as shown, are substantially rectilinear and set at 90° with respect to side 1a. It is however possible that one of said sides, particularly rear side 1c may have a curvilinear profile, for example, as a circle arch convex toward the exterior.

The second side 3 of the clamp is substantially plane and rectilinear and, when in rest position (Fig. 1), it forms, with the plane on which head 1 lies, an angle smaller than 90°. The end edge 3b of side 3 of the clamp is folded inwardly, so that when the clamp is applied to the picture holder, said edge 3b inserts itself by snap action into a slot 7 in rear panel 4 thereby to permit locking the clamp to the picture holder.

The clamp in question is provided, on the side 3, with a tongue 8 obtained by shearing on said side 3, which is folded toward the interior of the clamp so that when the latter is applied to the picture holder, said tongue acts with a certain amount of pressure on rear panel 4, to ensure stable securing of the clamp and frame, as it will be appear more clearly in the following of this specification.

The particular conformation above described of the head 1 of the clamp, makes possible the application of a section 2 forming one of the sides of the frame. In particular, said section 2, like head 1 of the clamp, is substantially "U" shaped in cross section. The main side 2a of section 2 is disposed substantially parallel and in contact with the main side 1a of head 1 of the clamp, while its opposite sides 2b and 2c have their end edges 2d and 2e folded at an angle of 90°, so that section 2 can embrace head 1 of the clamp.

With reference to Figs. 1 to 5, in particular to Fig. 5, the assembly of one side of the frame is effected as follows.

At first the clamp has been applied to the picture holder being accordingly disposed as shown in Fig. 3. In particular, when the clamp is applied, its two sides, that is, head 1 and side 3 are caused to diverge to permit the insertion of folded edge 3b of side 3 in the slot 7 in rear panel 4. The clamp, which tends elastically to return to the rest position shown in Fig. 1, in addition to engaging folded edge 3b in slot 7, causes engagement of the folded edge 1d of head 1 of the clamp to engage under pressure against front panel 5. This locking action is enhanced by the pressure tongue 8 which, by pressing on rear panel 4, tends to urge the clamp toward the rear part of the picture holder, thereby increasing the pressure of the folded edge 1d on front panel 5.

At this stage it is possible to apply section 2 on head 1 of the clamp and for this purpose, as shown in Fig. 5, a pressure is at first exercised on the clamp in the direction of arrow F so that, by compressing tongue 8, side 3 of the clamp shifts toward rear panel 4, whilst at the same time folded edge 1d of head 1 of the clamp disengages from front panel 5. Section 2 is caused to rest, with its folded edge 2d, against front panel 5 and, when the clamp has been brought in the position shown in Fig. 5, it is sufficient to rotate section 2 in the direction of arrow "G" until it shifts from the position shown by the dashed line to that shown by the continuous line. The clamp is then released by removing the pressure action on its rear side 3, and it will take on the position shown in Figs. 2 and 4. From these figures it can be noted that folded edges 2d and 2e of section 2 engage, under pressure, respectively with front panel 5 of the picture holder and with portion 3a of rear side 3 of the clamp. At this point the side considered of the frame completely embraces the head of clamp 1 and it is maintained in position, thanks to the engagement of its folded edges as above described. The positioning of section 2 and its locking on head 1 of clamp are particularly stable also due to the fact that the folded edges 1d and 1e of head 1 of the clamp prevent any upward shifting of the section 2, since such folded edges form a stop for the folded edges 2d and 2e of channel 2.

The complete frame is obtained by proceeding as described above for the three remaining sides of the picture holder.

To remove section 2, that is, to disassemble the frame, it is sufficient to proceed in the reverse order and with the same operations; therefore the disassembly will not be described in detail.

With particular reference to Fig. 2, it is noted that when section 2 is fitted on head 1 of the clamp, folded edge 1d of the latter will no longer be in contact with front panel 5, but a certain amount of clearance D will exist between the two elements considered. This feature has been contemplated in order that the thrust exercised by tongue 8 be imparted by edge 3a of the clamp to section 2 causing its edge 2d to adhere perfectly to front panel 5. Without such clearance the frame could be slightly detached from panel 5, which would be unesthetic for the picture holder.

Fig. 6 represents the cross section of a clamp which is altogether similar to that shown in Figs. 1 to 5 and which has the same novelty concept of the former. In this figure, the elements similar to those illustrated in Figs. 1 to 5 are identified with the same reference numbers. Note that, also in this case, head 1 of the clamp is substantially "C" shaped and the opposite sides 1b and 1c of the head converge toward each other. Section 2 has

internally, in cross section, a shape complementary to the external shape of head 1 of the clamp, so that it can be inserted slidably on the clamp head. Section 2 is therefore "C" shaped and its opposite sides 2b and 2c have an increasing thickness in the direction of convergence of sides 1b and 1c of head 1 of the clamp.

It should be noted further that the top end edge 3a of rear side 3 of the clamp forms an acute angle with side 1c of head 1 of the clamp, thereby creating a seat for side 2c of section 2. Read side 3 of the clamp connects with the lower end edge 3b through a portion 3c which is substantially "L" shaped one of its sides being in contact with rear panel 4.

Also the clamp shown in cross section in Fig. 7 as applied to the picture holder, has the same novelty concept as the clamps shown in Figs. 1 to 6; in fact, also in this case, clamp head 1 is substantially "C" shaped. In this figure too, the elements corresponding to those of the previous figures are identified with the same reference numbers. More specifically, one of the two opposite sides of said "C", the front side 1b of head 1, has its end edge 1d folded at a 90° angle with a clearance D with respect to glass panel 5. The folded edge 2d of section 2 engages with front panel 5 for the reasons already explained above, with reference to Fig. 2. The second of the two opposite sides of head 1, i.e. rear side 1c, is provided with a substantially central and longitudinal notch, so that said side is substantially "V" shaped. It therefore forms a seat for side 2c of section 2 which therefore has a central and longitudinal projection of complementary shape to that of side 1c. It should be noted that, also in this case, section 2 is substantially "C" shaped in cross section.

For the application and removal of section 2 from the clamp shown in Fig. 7, the same procedure as that described for the clamp shown in Figs. 1 through 5 also applies in this case. In fact, in this case too the length of folded edge 2d of channel 2 is greater than the length of folded edge 1d of head 1 of the clamp.

The clamp according to this invention, as illustrated in Fig. 8, is provided, also in this case, with a shaped head 1 which is substantially "C" shaped in cross section. The head is provided, on its two opposite sides, with projections parts associated with grooves to permit the application of section 2 of the frame, the internal form of which, in cross section, is complementary to the form of head 1 so that when section 2 is applied on head 1 it completely embraces the latter and cannot be removed.

As it can be seen in the figure referred to above, the opposite sides 1b and 1c of head 1 are each provided with a recess substantially central and longitudinal as a result of which said sides are substantially "V" shaped. Correspondingly, opposite sides 2b and 2c of section 2 are provided, centrally and longitudinally with a projection complementary shaped to the V shaped recess according to which sides 1b and 1c of the clamp are shaped. Said projections once inserted in the recesses of sides 1b and 1c make it possible to lock section 2 to the picture holder. In this case, similarly to the clamp shown in Fig. 6, the application of section 2 to head 1 of the clamp is achieved by sliding section 2 longitudinally on head 1 and in this case it is not possible to apply the section transversally as shown in Fig. 5 for the clamp of Figs. 1 through 5.

The above-mentioned transversal application is particularly advantageous, being evident that such application permits obtaining a complete frame, which would not be possible by utilizing the clamps shown in Figs. 6 and 8. In fact, the application of the sides of the frame by longitudinally sliding channel 2 on head 1 of the clamps can occur on three sides only. The fourth necessarily requires transversal application as shown in Fig. 5 for the application of the fourth side. Therefore, a complete frame can be utilized in two ways. The first way is to utilize on the four sides of the picture holder the clamp shown in Figs. 1 to 5 or in Fig. 7. The second way is to utilize on three sides one of the two clamps of Figs. 6 and 8 and on the fourth side one of the two clamps shown in Figs. 1 to 5 and Fig. 7.

Figs. 9 and 10 show two among the many possibilities of embodiment of frames using the clamp according to this invention. The frames illustrated in Figs. 9 and 10 contemplate application of the section 2 only on two opposite sides of the picture holder in particular the top and bottom sides. This application should be however taken only as an examples because as above stated the frame is to be applied on the four sides of the picture holder.

Having specific reference to Fig. 9 in which the elements similar to those of the previous figures have been identified with the same reference numbers, two sections are applied on the picture holder on the top and bottom sides respectively, providing on each of said sides the insertion of two clamps according to this invention, and of which the head 1, is shown schematically, as it clearly appears for the bottom side.

It can also be noted that the length of section 2 is greater than that of the corresponding side of the picture holder to which said channel is applied. This may advantageously increase the aesthetic

originality of the frame, but naturally the length of channel 2 may be equal to that of the sides of the picture holder and may be completed on the remaining vertical sides.

5 The picture holder shown in Fig. 10 is multiple in that it contemplates the display of three subjects or photographs 6, each of which is arranged between a rear panel 4 and a front panel 5. The length of sections 2 is equal to the sum of the top and bottom sides of the panels. Even if not shown in Fig. 10, to each one will be applied one or two clamps as shown schematically in Fig. 9.

10 Also the picture holder of Fig. 10 can be completed with two additional channels 2 on the vertical sides.

15 It is clear that variants and/or modifications may be introduced in the clamp according to this invention without departing from the scope of the invention.

20

### Claims

25 1. Clamp for the reciprocal locking together of two panels for the formation of a picture holder, apt to permit the application of a frame, said clamp being formed by a substantially "L" shaped lamina made of elastic material, one side or "head" of said lamina being suitable to be applied to the edge of the picture holder, while its second side is apt to be fitted on the rear of the picture holder, said second side being provided with an elastic tongue, apt to engage by pressure with said rear panel of the picture holder, characterized in that the side or head (1) of the clamp is essentially "C" shaped in cross section and has recessed or projecting parts apt to permit the application of a section (2) which is also substantially "C" shaped in cross section and apt to embrace fully said head (1) of the clamp from the exterior, engaging with said recessed and/or projecting parts of said head.

30 40 2. Clamp according to claim 1, characterized in that head (1) of the clamp, substantially "C" shaped in cross section, has its end edges (1d, 1e) folded over substantially at a 90° angle toward the interior of said "C" with respect to the opposite sides (1b, 1c) of the "C" section.

3. Clamp according to the claim 1, characterized in that one of the opposite sides of said "C" of head (1) of the clamp, in particular side (1c) which is set on the rear of the picture holder, has a curvilinear outline essentially shaped as the convex arc of a circle toward the extension of the clamp.

55

4. Clamp according to claims 1 and 2, characterized in that rear side (3) of the clamp connects to head (1) of the latter with an end edge (3a) which is perpendicular to the folded over edge (1e) of head (1).

5. Clamp according to claims 1 and 2, characterized in that section (2) suitable to be applied to said clamp and having a substantially "C" shaped cross section, has the end edges (2d and 2e) folded at 90° with respect to the opposite sides (2b and 2c) of said "C".

6. Clamp according to claims 2 and 5, characterized in that the length of folded edge (1d) of head (1) of the clamp is shorter than folded edge (2d) of section (2), so that head (1) of the clamp can be shifted by exerting a pressure on rear side (3) by compressing lamella (8) toward the rear of the picture holder, thereby disengaging folded edge (1e) of head (1) from folded edge (2e) of channel (2) to disengage and remove the latter from the clamp.

7. Clamp according to claims 2 and 4, characterized in that end edge (3a) of rear side (3) of the clamp engages with the end of folded edge (2e) of section (2) which constitutes the side of the frame due to the effect of the pressure applied by tongue (8) against rear panel (4) and as a result the end of folded edge (2d) of the section (2) is held against front panel (5) between the edge of folded end (1d) of the head (1) and panel (5) with a limited clearance (D).

8. Clamp according to claim 1, characterized in that head (1) of the clamp, substantially "C" shaped in cross section, has its opposite sides (1b and 1c) convergent toward the interior of the clamp, the rear side (3) of the clamp being connected to rear side (1c) of head (1), with one end edge (3a) perpendicular to said rear side (3) and forming an acute angle with rear side (1c) of head (1), section (2) having internally in cross section, a form complementary to that of clamp head (1).

9. Clamp according to claim 1, characterized in that clamp head (1), substantially "C" shaped in cross section, has its front side (1b) with its end edge (1d) folded at an angle of 90° with respect to said side, while rear side (1c) has a substantially central and longitudinal recess and is therefore substantially "V" shaped, section (2), also substantially "C" shaped has the end edge (2d) of its front side (2b) folded at a 90° angle with respect to said side and of a length greater than folded edge (1d) of clamp head (1), the rear side (2c) of section (2) being provided with a substantially central and longitudinal projection suitable to engage in the recessed part of rear side (1c) of head (1).

10. Clamp according to claim 10, characterized in that rear side (1c) of head (1) engages with the rear side (2c) of section (2) due to the effect of the

pressure exerted by tongue (8) on rear panel (4) and, consequently the end of folded edge (2d) of section (2) is maintained against front panel (5), between the end of folded edge (1d) of head (1) and panel (5) existing a limited amount of clearance (D).

11. Clamp according to claim 1, characterized in that clamp head (1), substantially "C" shaped in cross section, has its opposite sides (1b, 1c) provided with a substantially central and longitudinal recess, said sides being therefore substantially "V" shaped the section (2), also "C" shaped in cross section, having its opposite sides (2b; 2c) provided internally with a substantially central and longitudinal projection apt to engage with the recessed part of sides (1b, 1c) of head (1) of the clamp.

20

25

30

35

40

45

50

55

Fig. 1

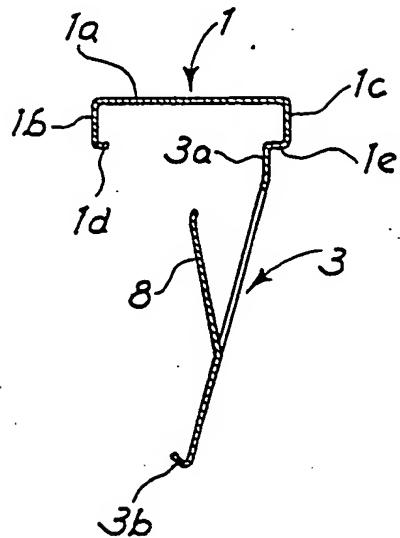


Fig. 2

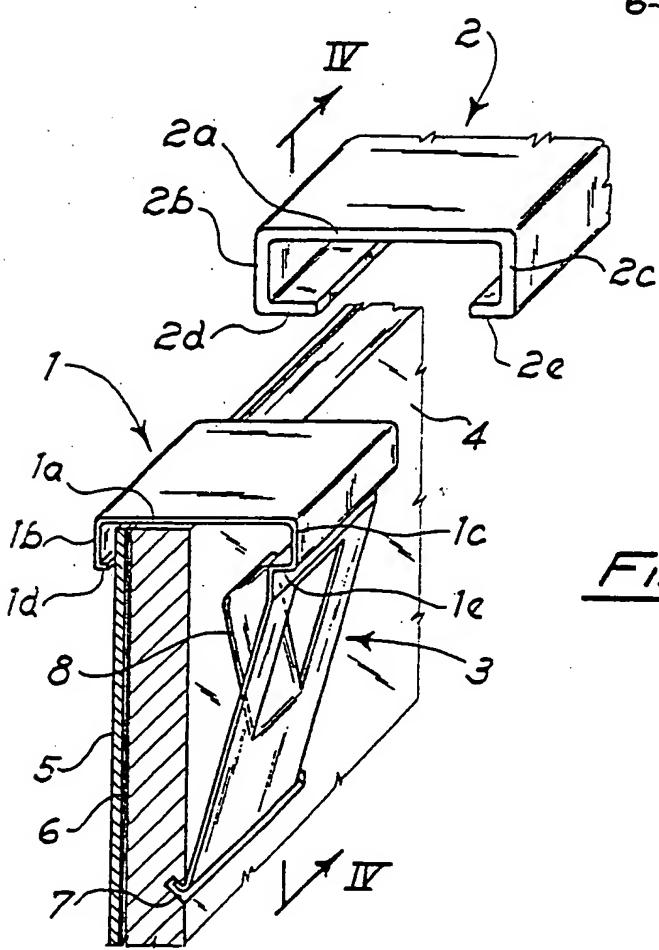
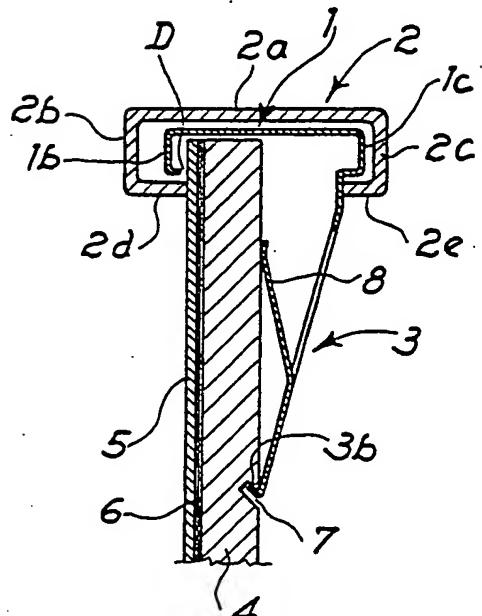


Fig. 3

Fig. 4

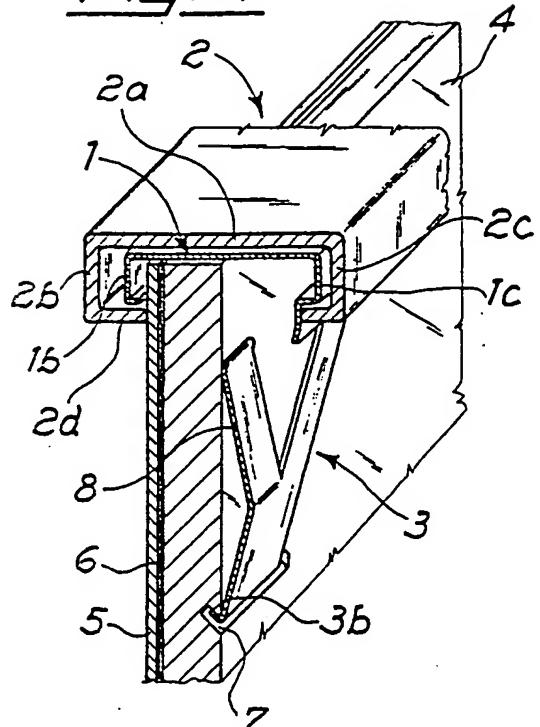


Fig. 5

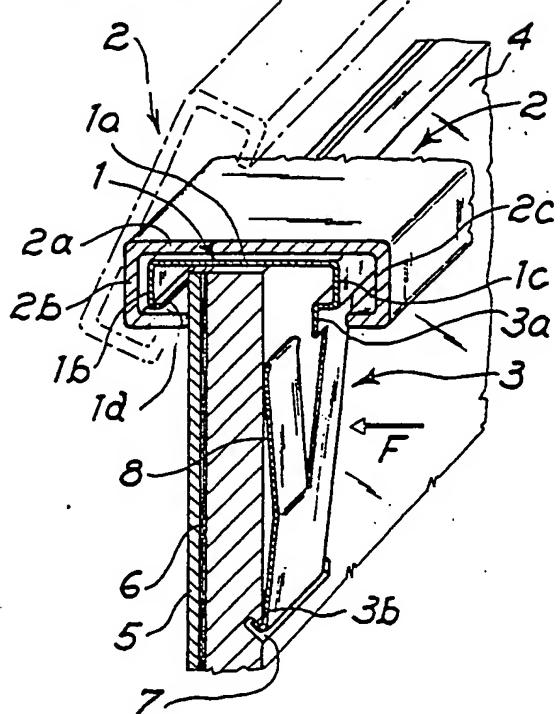
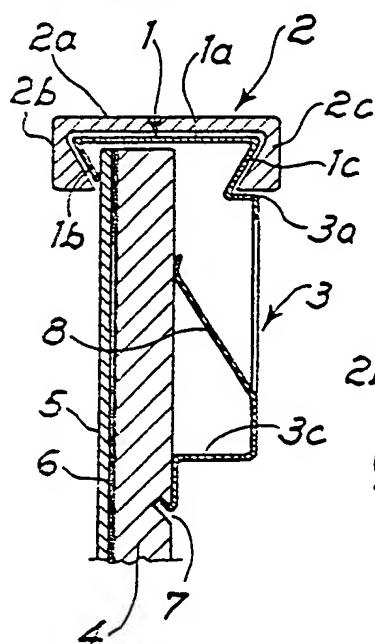


Fig. 6



1c Fig. 7

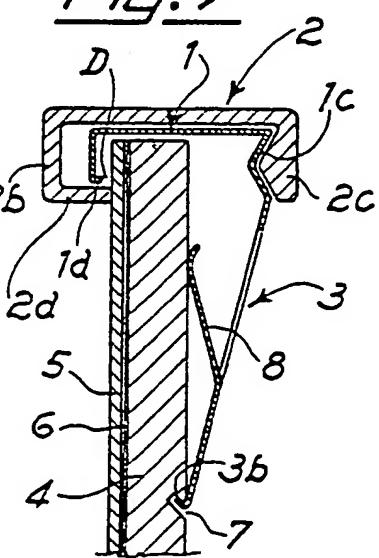
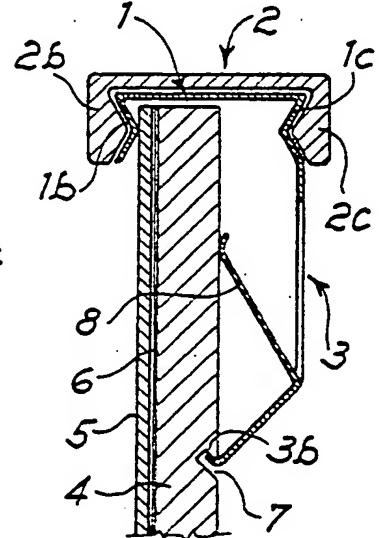
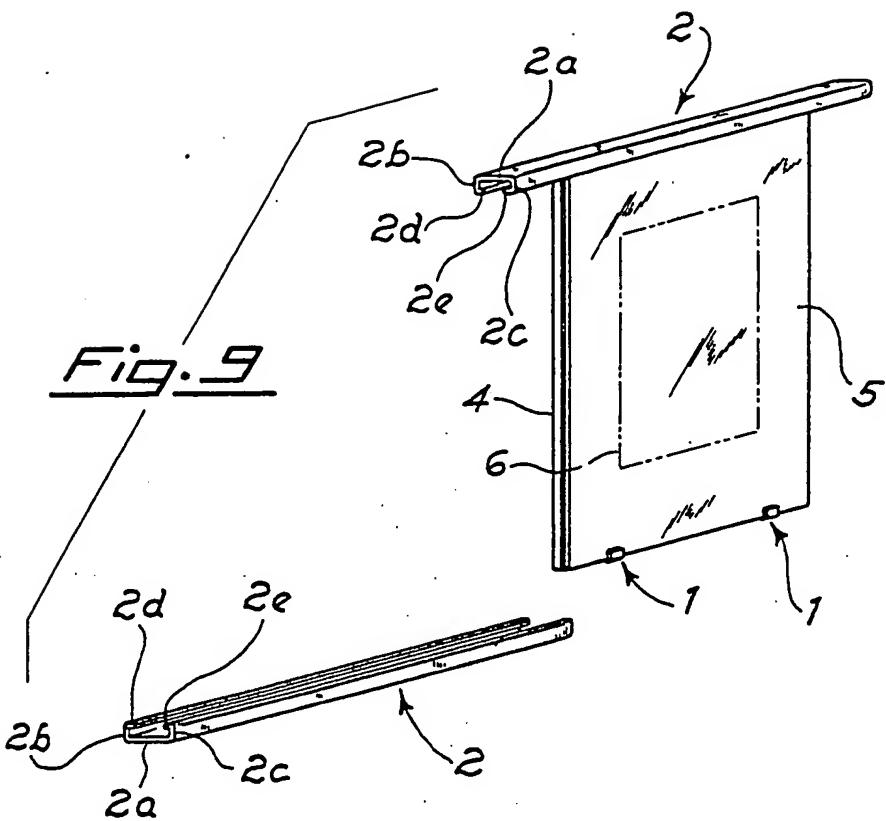
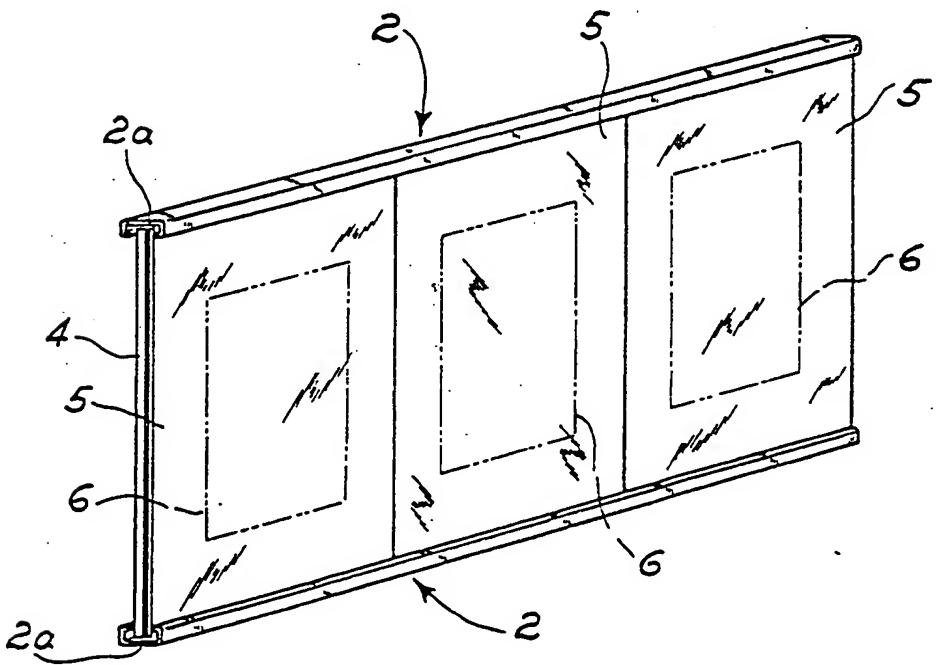


Fig. 8



Fig. 10



European Patent  
Office

EUROPEAN SEARCH REPORT

Application number

EP 86 83 0281

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl 4)
A	DE-U-1 871 429 (GLANDER) * figure 1 *	1,5	F 16 B 2/24
A	CH-A- 595 811 (PANO-PRODUKTION) * figure 3, claim 1 *	1	
A	FR-A-2 058 674 (SOCIETE NOUVELLE DE FABRICATION D'ARTICLES METALLIQUES - SONOFAM) * figure 4 *	1	
A	FR-A-2 275 674 (BUB) * figures 4, 5 *	1	
A	FR-A-2 282 836 (SCHLEIPER et al.) * figure 7 *	1	TECHNICAL FIELDS SEARCHED (Int. Cl 4)
A	US-A-3 798 815 (WARD) * figure 5 *	1	F 16 B 2/24 A 47 G 1/10
The present search report has been drawn up for all claims			
Place of search BERLIN		Date of completion of the search 12-05-1987	Examiner ZAPP E
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document			
T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

**This Page is Inserted by IFW Indexing and Scanning  
Operations and is not part of the Official Record**

**BEST AVAILABLE IMAGES**

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images include but are not limited to the items checked:

**BLACK BORDERS**

**IMAGE CUT OFF AT TOP, BOTTOM OR SIDES**

**FADED TEXT OR DRAWING**

**BLURRED OR ILLEGIBLE TEXT OR DRAWING**

**SKEWED/SLANTED IMAGES**

**COLOR OR BLACK AND WHITE PHOTOGRAPHS**

**GRAY SCALE DOCUMENTS**

**LINES OR MARKS ON ORIGINAL DOCUMENT**

**REFERENCE(S) OR EXHIBIT(S) SUBMITTED ARE POOR QUALITY**

**OTHER:** \_\_\_\_\_

**IMAGES ARE BEST AVAILABLE COPY.**

**As rescanning these documents will not correct the image problems checked, please do not report these problems to the IFW Image Problem Mailbox.**